

STATE OF COLORADO

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Douglas H. Benevento, Executive Director

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Colorado Department
of Public Health
and Environment

January 19, 2005

Joe Legare
Director, Project Management
U.S. Department of Energy-RFPO
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

RE: Draft IM/IRA for the Original Landfill (December 6, 2004)

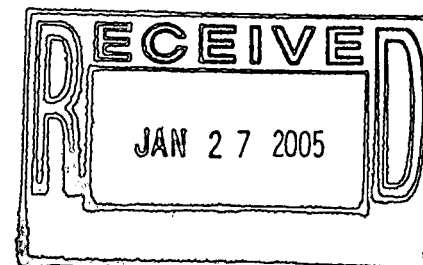
Dear Mr. Legare:

The Colorado Department of Public Health and Environment and the U.S. Environmental Protection agency have reviewed the draft Interim Measures/Interim Remedial Action for the Original Landfill and are providing the attached comments. If you have any questions regarding CDPHE comments, please contact Carl Spreng at 303-692-3358; questions on EPA comments should be directed to Vera Moritz at 303-312-6981.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc: Dave Shelton, K-H
Mark Aguilar, EPA
Mark Sattelberg, USF&W
Susan Chaki, CDPHE
Dan Miller, AGO
Administrative Record, T130G



ADMIN RECORD

OU05-A-000734

Colorado Department of Public Health & Environment
comments on
Draft IM/IRA for the Original Landfill (December 6, 2004)

Executive Summary (page x)

The groundwater bullet states that, "there are no Tier I action level exceedances for any constituents." The exception is U-238 (see Section 4.5.2).

The next-to-last sentence in the groundwater bullet conflicts with the first sentence in the surface water bullet. Replace "detectable levels" with "surface water standards" to make the next-to-last sentence in the groundwater bullet a true statement.

Section 2.5 (page 2-6)

The annual walkdowns of the landfill surface mentioned in the last paragraph were conducted prior to 2000, but it is our understanding that they were discontinued.

The hotspot removals conducted in July 2004 are mentioned elsewhere in this document, but should also be mentioned here to make this section a complete history of previous interim responses.

Section 3.5.5 (page 3-5)

The statement that "the fault is not expected to disrupt the engineering features ... and does not appear to impact groundwater hydrogeology" should be supported with evidence or references.

Section 3.6 (page 3-9)

Correct the last sentence of the third paragraph. While the weathered bedrock may be about 20 feet thick, the unweathered bedrock is hundreds of feet thick.

Section 3.6 (page 3-10)

The quantity of water removed by the drains is important to the model calibration even if the drains are removed in the closure configurations because this flux becomes part of the groundwater flow.

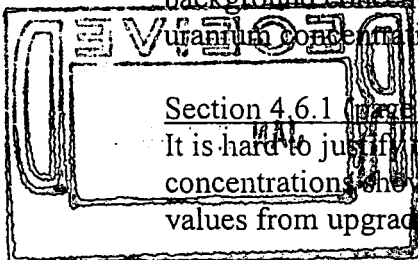
Explain why the wet year climate not also assessed for scenarios 3 and 4.

Section 4.5.2 (page 4-7)

Please revise or remove the "perspective" statement in the last sentence of this section since the background concentration is above health-based levels. Recent data from this well show uranium concentrations as high as 250 pCi/L.

Section 4.6.1 (page 4-9)

It is hard to justify the conclusion in the last sentence of this section given that several average concentrations shown in Tables 4-4a and 4-4b exceed surface water standards. The average values from upgradient surface water stations shown in Table 4-4a yield a U-234:U-238 ratio of



greater than 3:1. This ratio indicates the possibility of an upgradient source of depleted uranium affecting surface water in Woman Creek. Since uranium was disposed in an IHSS upgradient to the OLF, this data should be mentioned in this section.

Section 4.8 (page 4-12)

In order to clearly distinguish the hotspot removal action mentioned in the first action determination bullet from other earlier removal actions, the bullet should add that this action took place in July 2004 and removed four areas with elevated uranium concentrations.

Figure 4-20

The lines connecting the data points on this graph imply a connection or relationship between wells, which is probably not intended.

Section 5.0 (page 5-2)

The Regulatory Contact Record mentioned in the fifth paragraph is missing from Appendix C.

It is unclear why it is assumed in the sixth paragraph that some subsurface soil may exceed soil ALs for depleted uranium below the hotspots when the confirmation sampling resulted in levels below ALs.

Section 5.0 (page 5-3)

The hot spot removal action should be listed as the first component of the source containment remedy.

Section 6.2.2 (page 6-13)

The preferred alternative is an 18% regrade without a buttress. It appears, however, that this alternative is marginally stable under static conditions, and will be displaced an estimated 5 to 10-inches under seismic conditions. Both static and seismic stability appear to be on the edge of instability. Intuitively, any input changes to reflect more conservative conditions will probably cause the F.S. to decrease, thereby dropping the regrade (no buttress) alternative to below the industry acceptable static F.S. of 1.5. As described above, several of the selected inputs used for the modeling appear unconservative, as summarized below:

- One of the modeling runs for the 18% regrade only (no buttress) already shows an unacceptable F.S. (1.4) under static conditions.
- If the critical section is modeled (Section A from the M&E Report), the groundwater will be higher, reducing the soil strength and subsequently lowering the F.S.
- The high groundwater condition modeled in the stability runs were 2-feet above average groundwater conditions. However, the groundwater modeling discusses 5 to 10-feet of fluctuation.
- The friction angles selected for static (20°) and seismic (15°) analysis do not bracket all of the samples tested. The lowest friction angle for a material should be used.

Detailed comments concerning the stability calculations in the accompanying geotechnical report have been previously submitted. The cumulative effect of those comments is to question whether Alternative 2 could provide the protectiveness described in this section. It appears that the most viable option is to include the additional stability that a buttress would provide and

select Alternative 3 as the preferred alternative. The stability calculations must therefore be revised and the text re-written as appropriate.

Section 6.2.3 (page 6-15)

This presentation of Alternative 3 should be reviewed to see if the text is consistent with recent discussions regarding the design of a buttress fill and drain.

Section 7.0 (page 7-1)

This section must be revised to reflect Alternative 3 as the preferred alternative. Sufficient detail should be provided so that the alternative can be evaluated against the evaluation criteria. The text should mention that design details will be provided in an approved design document.

Section 7.4 (page 7-3)

This section or Section 10 should commit to the development of a post-closure maintenance and monitoring plan.

Piezometers may provide valuable information in areas where high ground water is predicted.

Section 7.5 (page 7-3)

Complete sentence in control #3 with "will be prohibited".

Section 8.0

An attached table lists additional ARARs that should be included in this section and in Appendix A.

Section 9.3 (page 9-3)

This section should be more specific about how the regraded cover will "reduce surface water from percolating through the landfill to groundwater."

Appendix B

Since analytical results are not listed in these tables, it would be useful to mention where these data can be found, e.g., *Site Characterization Report - Original Landfill* (March 2002).

COLORADO HAZARDOUS WASTE ACT (CRS § § 25-15-101 to -217)

SOLID WASTE DISPOSAL ACT (aka: Resource Conservation and Recovery Act) [42 USC § 6901 et. seq.]

SUBTITLE C: HAZARDOUS WASTE MANAGEMENT

The State of Colorado is authorized to administer portions of the hazardous waste management program (e.g., RCRA) to regulate the generation, treatment, storage, and disposal of hazardous waste within Colorado. As such, the Colorado regulations that are more stringent than the federal counterparts would be applicable to the management of hazardous waste. These regulations may also be relevant and appropriate in situations where a remediation waste is "sufficiently similar" to a RCRA-listed waste (e.g., waste which was generated and disposed of prior to the effective date of regulation) or when the proposed remedial action is similar to a RCRA-regulated activity and would be appropriate to ensure that the activity is protective of human health and the environment. Although the Colorado hazardous waste management regulations are similar to the federal requirements, both the federal and state regulatory citations are provided for reference purposes and to denote that both federal and state requirements were considered in establishing the identifying the ARAR requirement adopted for the remediation of the RFETS. Only substantive portions of the regulations are required under CERCLA actions for onsite activities.

CLOSURE AND POST-CLOSURE	6 CCR 1007-3 Part 265, Subpart G [40 CFR 265, Subpart G]	A	The final cover will be designed to stabilize the hill slope with minimal maintenance.
• Minimizes the need for further maintenance	.111(a)		
• Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface water or to the atmosphere	.111(b)	A	The final cover will be designed to stabilize the hill slope. The cover will also help to minimize migration of potentially contaminated water, post-closure escape of hazardous constituents, and hazardous waste decomposition products to the ground or surface water or to the atmosphere.
• Complies with closure requirements in 265.310	.111(c)	A	This action will comply with, to the extent practicable, the substantive ARARs identified in this table for .310.
LANDFILLS	6 CCR 1007-3 Part 265, Subpart N (40 CFR Part 265)	A	Final cover will be designed to stabilize the hill slope with minimum maintenance.
• Function with minimum maintenance	.310(a)(2)		
• Promote drainage and minimize erosion or abrasion of the cover	.310(a)(3)	A	Final cover will be designed to promote drainage on the surface of the cover and will thereby reduce erosion or abrasion of the cover.
• Accommodate settling and subsidence so that the cover's integrity is maintained	.310(a)(4)	A	Final cover will be designed to accommodate settling and subsidence to maintain the cover's integrity; regular inspections will ensure the effectiveness of the design.

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COLORADO BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER			
• Basic standards applicable to surface waters of the state	5 CCR 1002-31	C/L	Basis for performance monitoring of surface water and groundwater.

Editorial/typographical comments (minor; changes not required):

Section 3.4 (page 3-8)

The partial sentence at the beginning of the last paragraph in this section should be deleted.

Section 3.6 (page 3-9)

The third sentence in the fourth paragraph should state either, "The lack of similarity..." or "The similarity..."

Section 3.6 (page 3-10)

In the fourth sentence in the sixth paragraph, change "average difference...within the OLF are..." to "average difference...within the OLF is..."

The next sentence would be improved by changing it to read, "At some well locations differences are greater than one foot, which can be attributed..."

Section 3.6

Use of units is sometimes inconsistent, e.g., on page 3-11, "feet", "ft." and "meter" are all used.

Section 4.3 (page 4-3)

This section describes a removal action that has already taken place. It is described elsewhere in the document in the past tense and should be in this section also.

Section 4.5.3 (page 4-7)

The bracket in the middle of the first paragraph should be removed (or a close bracket added at the end of the paragraph).

Section 4.5.3 (page 4-8)

Well 58693, mentioned in the middle of the Tetrachloroethene paragraph, is not shown on Figure 4-25 along with its accompanying data.

Section 4.6.2 (page 4-9)

The second-to-last sentence in the first paragraph is unclear. Two possible meanings are:
"Even if these additional detections can be attributed to the OLF, no analyte exceeded its action level more than 7% of the time."

Or

"Even if these additional detections can be attributed to the OLF, less than 7% of the analytes sampled exceeded the action level."

Section 4 maps

The eastings and northings do not always seem to align between maps of different scales within this set.

Section 5.0 (page 5-2)

Delete the last phrase ("such as for a drinking water.") from the last sentence in the eighth paragraph.

Section 6.2 (page 6-9)

The last paragraph should add a reference to Appendix D.

Section 6.2.2 (page 6-13)

The Geotechnical report should be properly referenced at the end of the second paragraph in the Effectiveness section.

Section 7.4 (page 7-3)

The subject is plural in the second-to-last sentence; the verb should be "are".

Section 10.1 (page 10-2)

**Integrated Flow and VOC Fate and Transport Modeling for the Original Landfill Fill
(October 30, 2004)**

Page 2: Does this report represent additional calibration performed since the 10/8/04 presentation to the agencies?

Page 3: Where are the detailed assumptions for the 100-year wet climate scenario?

Page 3: Please compare each scenario to the calibration case, rather than scenario 1.

Page 4: At least one surface seep is controlled by underlying geology. The surface regrade topography may not control the development of seeps in reality as well as it does in the model. The sensitivity and uncertainty in the model need to be assessed before relying on this prediction.

Figure 2-2: Each model cell on the hillside averages 4 feet of vertical change across a 25-foot cell. Please discuss how this is handled in assessing the calibration.

Figure 2-4: Non-waste area groundwater depths graph shows well P416889 with a water level depth of about 32 feet, however the total depth of this well is only 23 feet. The other significant decline shown for well P416089 is within the total depth for the well.

Figure 3-3 Note 3: Please explain: "Within major distributions soil types further subdivided based on depth to bedrock."

Please provide the Top of Weathered Bedrock grid and the hydraulic conductivity distributions for each model layer.

Figure 3-4: The legend for this figure printed incorrectly. Please discuss the impact of the physical slope on the calibration and how water levels were interpolated for this diagram.

Figure 4-5: UHSU inflow appears to be negative, however the text seems to indicate this is a positive value and out flow is a slightly larger volume, indicating that a slight amount of water is recharged through this modeled area. Even though inflow and outflow are approximately 1/3 the volume of infiltration and evapotranspiration, the flux through the system is still important to the total volume of water in the system.

Page 31: Wet climate worst case shows 5-15 feet above the present ground water table, but localized areas where the water table is 20 feet above the weathered bedrock. Was this simulated in the stability calculation?

The new preferred alternative for the OLF (including a buttress fill with drain) may significantly alter parameters for the fate and transport modeling. If so, the model should be re-run.

Environmental Protection Agency comment on:

- **Draft Interim Measure/Interim Remedial Action for the Original Landfill (December 6, 2004)**
- **Revised Draft IM/IRA Section 7 (email January 12, 2005)**
- **Postclosure monitoring text and map (email January 10, 2005)**

Executive Summary

The text of the Executive Summary should be revised to reflect the new proposed alternative.

Section 3.8, Ecological Setting

This section should include a basic description of the aquatic habitat, including fish and benthic invertebrate populations associated with Woman Creek, as presented in the "Results of the Aquatic Monitoring Program in Streams at the Rocky Flats Site" (June 2004).

Section 4.0, Environmental Data Summary

This Section should be revised to include comparisons to the Accelerated Action Ecological Screening Levels. This is appropriate because this IM/IRA will effectively be the final action for the Original Landfill.

Section 4.4, Subsurface Soil

The discussion regarding subsurface soil does not indicate the depth of borings; it appears that the reported results are for samples composited over 6- to 16-foot intervals. Please clarify how these sampling intervals relate to comparison to Action Levels.

The discussion of exceedances to the WRW Action Levels only includes the first component of the Subsurface Soil Risk Screen outlined by the Action Level Framework (ALF). Please present an evaluation of Screens 4 and 5 of the ALF.

Section 4.9, Risk Assessment

The ecological risk assessment is based on a summary from the 1996 RFI/RI report, and no longer current. It should be updated to include data from RADMS verified/validated since 1996, with comparisons to the recently finalized Accelerated Action Ecological Screening Levels (ESLs).

Section 5.0 Remedial Action Objectives

EPA's Presumptive Remedy guidance indicates the need to address leachate as part of the containment remedy. Therefore, the remedial action objectives should address management of landfill leachate (please see comment re: Section 7.0 below). Future sampling of this leachate should include analysis of radiological, VOC, metals, SVOC and pesticide analyte suites.

Because the location of the original landfill is within and immediately adjacent to primary habitat in a National Wildlife Refuge the remedial action objectives should include revegetation of the cover and buttress consistent with goals of the Refuge. The following elements should be included: revegetation of the soil cover and buttress with native species to reduce infiltration, control erosion, burrowing animals, and prevent intrusion of noxious weeds.

Table 6.1, Summary of Comparative Evaluation. This table should include a line for compliance with ARARs, which is one of the threshold criteria for selection of alternatives. Also, community acceptance is a modifying criteria under the NCP, and usually filled in after public comment is received.

Section 7.0 The list presented should include a bullet specifying leachate management (sampling with collection and treatment as needed).

Section 7.1, Removal of Surface Soil hot spots

The text indicates that "soil with concentrations above the Wildlife Refuge Worker and Ecological Receptor action levels were removed." Ecological receptor action levels have not been developed. Review of Appendix C indicates that the removal was based solely on comparisons to the WRW action levels. Please revise.

Section 7.2, Area grading. Please indicate that control measures will be implemented during the grading process to prevent the spread and release of waste materials, not simply "control" such spread.

Please indicate that performance monitoring criteria for determining the success of revegetation will be established as part of monitoring requirements in consultation with the RFCA parties.

Section 7.3, Buttress fill. (a) We recommend consideration of a drain design in line with the conceptual drawing provided to DOE on December 9, 2004 and suggest text to reflect that final drain design will be determined during the design phase. The conceptual drain design was intended to facilitate lowering of the ground water level within the landfill profile. (b) Please add text indicating that the drain will be designed to minimize clogging and maintenance.

Fig. 7.1, Conceptual Buttress Fill Cross Section. This conceptual cross section indicates that the 2-foot soil cover will end at the beginning of the buttress fill. We recommend a modification to this concept, wherein the soil cover material extends over the surface of the buttress fill (both horizontal and sloped face) to facilitate revegetation.

Section 7.4, Soil cover. Please indicate that both the soil cover and the buttress will be revegetated to reduce infiltration, control erosion, burrowing animals, and prevent intrusion of noxious weeds.

Section 9.2, Impacts to surface water. This section indicates that post-accelerated action monitoring activities will include inspections of the landfill surface. Please add text to indicate that performance monitoring criteria for the vegetative cover will be established in consultation with the RFCA parties.

Section 10, Table 10.1. Entries in this table indicate that monitoring will be performed for 5 years. Please add a note clarifying that this timeframe corresponds to the regulatory five year review, upon which further monitoring determinations may be made.

This table should be modified to include leachate sampling as indicated above, and include radiological monitoring (Americium and Plutonium) for the surface water sampling locations.

Please indicate that vegetation will be monitored pursuant to specified performance monitoring criteria (to be established as part of monitoring requirements in consultation with the RFCA parties).